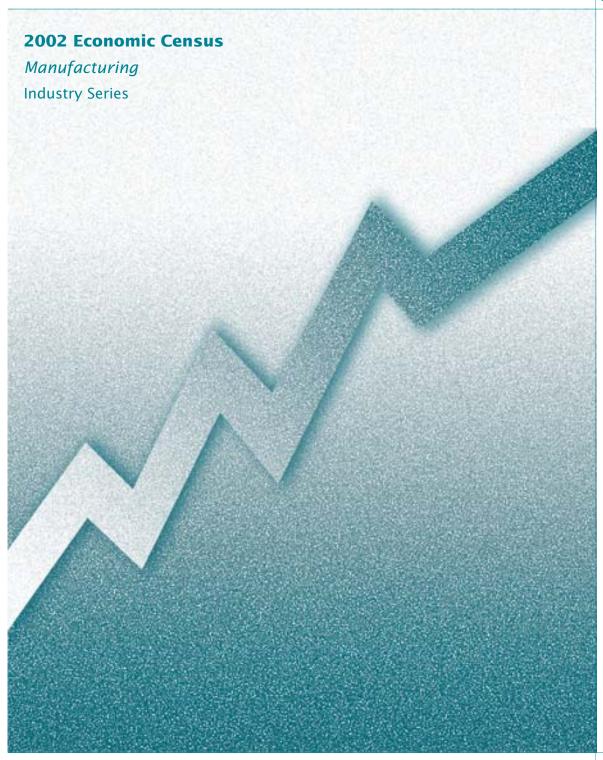
Flavoring Syrup and Concentrate Manufacturing: 2002

Issued December 2004

EC02-311-311930 (RV)





Helping You Make Informed Decisions

U.S. Department of Commerce Economics and Statistics Administration U.S. CENSUS BUREAU



CONTENTS

	duction to the Economic Census	v ix
Table	es	
1. 2. 3. 4. 5. 6a. 6b. 7.	Historical Statistics for the Industry: 2002 and Earlier Years Industry Statistics for Selected States: 2002 Detailed Statistics by Industry: 2002 Industry Statistics by Employment Size: 2002 Industry Statistics by Primary Product Class Specialization: 2002 Products Statistics: 2002 and 1997 Product Class Shipments for Selected States: 2002 and 1997 Materials Consumed by Kind: 2002 and 1997	1 2 3 4 5 6 7
Appe	endixes	
A. B. C. D. E. F.	Explanation of Terms	A-1 B-1 C-1 F-1

-- Not applicable for this report.

Table 1. Historical Statistics for the Industry: 2002 and Earlier Years

[Data based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). For information on confidentiality protection, sampling error, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Industry and year ¹		All estab- lish- ments ³	All employees		Production workers				Total	Total	Total capital
	Com- panies ²		Number ⁴	Payroll (\$1,000)	Number ⁴	Hours (1,000)	Wages (\$1,000)	Value added (\$1,000)	cost of materials (\$1,000)	value of shipments (\$1,000)	expendi- tures (\$1,000)
311930, Flavoring syrup and concentrate											
manufacturing2002	145	163		230 319	3 556	7 044	129 141	7 030 401	1 288 785	8 317 893	79 144
2001 2000	N N	N N	5 734 5 450	268 521 243 045	3 572 3 432	7 462 7 810	147 227 134 149	6 499 942 6 503 414	1 595 182 1 633 142	8 039 108 8 108 823	69 677 64 038
1999	N	N	5 546	234 932	3 603	8 077	130 725	5 787 753	1 734 800	7 468 391	92 437
1998 1997	N 149	N 175	5 699 6 243	211 165 225 770	3 143 3 348	6 254 6 839	105 280 111 627	5 260 934 4 945 331	1 646 714 1 648 212	6 901 081 6 590 816	79 272 144 097
1007	143	175	0 240	223 110	0 040	0 000	111 027	T 373 001	1 040 212	0 330 010	144 037

¹Statistics presented for years ending in 2 and 7 are census data. Interim census years are derived in a representative sample of manufacturing establishments canvassed in the Annual Survey of Manufactures (ASM).

²For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

³Includes establishments with payroll at any time during the year.

⁴Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain sampling errors and nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

Table 2. Industry Statistics for Selected States: 2002

[States that are a disclosure or with less than 100 employees are not shown. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, explanation of terms, and geographical definitions, see note at end of table. For information on geographic areas followed by *, see Appendix D. For meaning of abbreviations and symbols, see introductory text]

		All establishments ²		All employees		Production workers						
Industry and geographic area	E¹	Total	With 20 em- ploy- ees or more	Number ³	Payroll (\$1,000)	Number ³	Hours (1,000)		Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expendi- tures (\$1,000)
311930, Flavoring syrup and concentrate manufacturing												
United States. California Florida Illinois Missouri New York Wisconsin	1	163 30 6 10 5 13	67 15 3 3 2 5 3	5 515 1 339 135 784 139 239 250	230 319 58 559 5 232 31 274 7 255 10 228 8 923	3 556 765 93 669 81 151 202	7 044 1 487 198 1 400 161 314 420	129 141 28 339 2 807 23 005 2 934 4 925 6 196	7 030 401 671 470 76 266 173 931 68 694 49 582 56 382	1 288 785 218 948 8 102 131 737 11 942 19 652 86 830	8 317 893 895 100 84 331 305 599 77 495 68 851 138 739	'79 144 '13 628 '1 445 '17 309 '2 603 '3 277 '5 377

¹Some payroll and sales data for small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate statistics for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of the figures shown: 1–10 to 19 percent; 2–20 to 29 percent; 3–30 to 39 percent; 4–40 to 49 percent; 5–50 to 59 percent; 6–60 to 69 percent; 7–70 to 79 percent; 8–80 to 89 percent; 9–90 percent or more.

¹Includes establishments with payroll at any time during the year.

³Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C. For geographical definitions, see Appendix D.

Detailed Statistics by Industry: 2002

[Data based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). For information on confidentiality protection, sampling error, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Item	Value
311930, Flavoring syrup and concentrate manufacturing	
Companies ¹ number .	145
All establishments ²	163 96 52 15
All employees³ number Total compensation \$1,000 Annual payroll \$1,000 Total fringe benefits \$1,000	5 515 288 349 230 319 58 030
Production workers, average for year	3 556 3 514 3 490 3 665 3 540
Production worker hours	7 044 129 141
Total cost of materials \$1,000. Materials, parts, containers, packaging, etc., used \$1,000. Resales \$1,000. Purchased fuels \$1,000. Purchased electricity \$1,000. Contract work \$1,000.	1 288 785 1 226 272 40 112 8 456 12 344 1 601
Quantity of electricity purchased for heat and power	183 844 -
Total value of shipments \$1,000 Primary products value of shipments \$1,000 Secondary products value of shipments \$1,000 Total miscellaneous receipts \$1,000 Value of resales \$1,000 Contract receipts \$1,000 Other miscellaneous receipts \$1,000	8 317 893 8 125 924 132 996 58 973 56 428 2 028 517
Primary products specialization ratio percent. Value of primary products shipments made in all industries \$1,000. Value of primary products shipments made in this industry \$1,000. Value of primary products shipments made in other industries \$1,000.	98 9 565 916 8 125 924 1 439 992
Coverage ratiopercent	85
Value added\$1,000	7 030 401
Total inventories, beginning of year \$1,000. Finished goods inventories \$1,000 Work-in-process inventories \$1,000 Materials and supplies inventories \$1,000	301 130 138 765 19 195 143 170
Total inventories, end of year \$1,000. Finished goods inventories \$1,000. Work-in-process inventories \$1,000. Materials and supplies inventories \$1,000.	289 958 138 981 20 272 130 705
Gross value of depreciable assets (acquisition costs) at beginning of year \$1,000 Total capital expenditures (new and used) \$1,000 Buildings and other structures (new and used) \$1,000 Machinery and equipment (new and used) \$1,000 Automobiles, trucks, etc., for highway use \$1,000 Computers and peripheral data processing equipment \$1,000 All other expenditures for machinery and equipment \$1,000 Total retirements \$1,000 Gross value of depreciable assets at end of year \$1,000	'1 090 605 '79 144 '12 956 '66 188 '2 124 '7 188 '56 876 '36 391 '1 133 358
Depreciation charges during year	^r 64 210
Total rental payments \$1,000. Buildings and other structures \$1,000. Machinery and equipment \$1,000.	25 059 12 259 12 800
Total other expenses ⁴ \$1,000. Response coverage ratio ⁵ percent. Repair and maintenance services of buildings and/or machinery ⁴ \$1,000. Communications services ⁴ \$1,000. Legal services ⁴ \$1,000. Accounting, auditing, and bookkeeping services ⁴ \$1,000. Advertising and promotional services ⁴ \$1,000. Expensed computer hardware and supplies and purchased computer services ⁴ \$1,000. Refuse removal (including hazardous waste) services ⁴ \$1,000. Management consulting and administrative services ⁴ \$1,000. Taxes and license fees ⁴ \$1,000. All other expenses ⁴ \$1,000.	143 064 72 17 931 1 406 1 502 367 7 598 2 052 5 742 1 005 5 720 99 742

¹For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.
2Includes establishments with payroll at any time during the year.
3Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.
4Based on 2002 Annual Survey of Manufactures (ASM) sample data.
5A response coverage ratio is derived for this item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight) for those Annual Survey of Manufactures (ASM) establishments that reported to the weighted total employment for all ASM establishments classified in this industry.

Note 1: The amounts shown for other expenses reflect only those services that establishments purchase from other companies.

Note 2: The data in this table are based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain sampling errors and nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

Table 4. Industry Statistics by Employment Size: 2002

[Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Employment size class			All emp	oloyees	Pr	oduction worke	rs		Total	Total	Total capital
		All estab- lish- ments ²	Number ³	Payroll (\$1,000)	Number ³	Hours (1,000)	Wages (\$1,000)	Value added (\$1,000)	cost of materials (\$1,000)	Total value of shipments (\$1,000)	expendi- tures (\$1,000)
311930, Flavoring syrup and concentrate manufacturing											
All establishments Establishments with — 1 to 4 employees 5 to 9 employees 10 to 19 employees 20 to 49 employees 10 to 29 employees 100 to 249 employees 500 to 999 employees 500 to 999 employees 1,000 to 2,499 employees 2,500 employees or more	3 4 6 3 1 - -	163 47 23 26 33 19 13 1 1	5 515 103 147 370 1 021 1 259 9 e f f	230 319 4 374 7 609 18 765 38 265 57 867 D D D -	3 556 70 87 199 635 735 D D D	7 044 122 151 386 1 203 1 574 D D D	129 141 3 000 3 842 8 901 20 305 25 405 D D	7 030 401 125 058 99 726 119 098 307 860 337 883 D D D	1 288 785 10 275 25 299 24 139 111 933 179 866 D D D	8 317 893 136 404 122 909 140 909 415 218 519 600 D D	79 144 (920) (1 443) (3 670) (8 777) (20 709) D D D
Administrative records ⁴	9	64	279	12 398	199	357	8 986	120 978	9 111	130 083	r2 830

¹Some payroll and sales data for small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate statistics for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of the figures shown: 1–10 to 19 percent; 2–20 to 29 percent; 3–30 to 39 percent; 4–40 to 49 percent; 5–50 to 59 percent; 6–60 to 69 percent; 7–70 to 79 percent; 8–80 to 89 percent; 9–90 percent or more.

¹Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

⁴Some payroll and sales data for small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate statistics for these small establishments. Data are also included in respective size classes shown.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

Table 5. Industry Statistics by Primary Product Class Specialization: 2002

[Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Industry or		All	All employees		Pr	oduction work	ers		Total	Total	Total capital
product class code	Industry or primary product class	estab- lish- ments ¹	Number ²	Payroll (\$1,000)	Number ²	Hours (1,000)	Wages (\$1,000)	Value added (\$1,000)	cost of materials (\$1,000)	value of shipments (\$1,000)	expendi- tures (\$1,000)
311930	Flavoring syrup and concentrate manufacturing	163	5 515	230 319	3 556	7 044	129 141	7 030 401	1 288 785	8 317 893	⁷ 79 144
3119301 3119304	Liquid beverage bases not for use by soft drink bottlers	18	1 106	42 792	853	1 760	28 652	254 935	166 695	421 336	r14 032
3119305	nonbottler distributors	25	1 439	68 635	905	1 823	35 543	4 915 995	619 514	5 537 988	r29 749
3119308	bulkOther flavoring agents (except	3	153	4 419	44	98	1 143	12 795	15 200	27 861	r1 258
3119300	chocolate syrups)	28	1 998	78 532	1 312	2 551	44 601	1 583 466	434 488	2 019 670	r22 537

¹Includes establishments with payroll at any time during the year.

²Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

Table 6a. Products Statistics: 2002 and 1997

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Duoduot		Number of companies with		Product	shipments
Product code	Product	shipments of \$100,000 or more	Quantity of production for all purposes	Quantity	Value (\$1,000)
311930	Flavoring syrup and concentrate manufacturing	N N	×	X	9 565 916 6 647 019
3119301	Liquid beverage bases not for use by soft drink bottlers	N N	X	X X X	561 848 243 083
31193011	Liquid beverage bases not for use by soft drink bottlers	N N	X	X X	541 655 171 609
3119301111	Cocktail mix beverage bases not for use by soft drink bottlers mil gal .2002 1997	19 23	×	^q 20.3 S	103 418 62 770
3119301121	Other liquid beverage bases not for use by soft drink bottlers	30 21	х	P167.8	438 237
3119301Y	Liquid beverage bases not for use by soft drink bottlers, nsk	N	X	S X X	108 839 20 193
3119301YWV	Liquid beverage bases not for use by soft drink bottlers, nsk	N N N	X X X	×	71 474 20 193 71 474
3119304	Liquid beverage bases, concentrates and syrups, for sale by soft drink bottlers, to trade or nonbottler distributors	N N	x	X	3 954 541
31193041	Liquid beverage bases, concentrates and syrups, for sale by	N	Х	X	3 570 847
3119304111	soft drink bottlers, to trade or nonbottler distributors	N N	X	X	3 917 189 3 502 510
3119304121	content, for sale to soft drink bottlers mil cases, 192 oz case equiv 2002	12 17	X	S S	333 313 368 061
	drink bottlers mil cases, 192 oz case equiv 2002 1997	9 12	X	D D	D
3119304131	Liquid beverage base syrups, for sale to soft drink bottlers mil cases, 192 oz case equiv 2002	14 9	X	D S	D 249 832
3119304141	Liquid beverage base concentrates with some juice content, for sale to trade or nonbottler distributors mil cases, 192 oz case equiv	10 5	X X	19.7 1.3	260 893 18 714
3119304151	Other liquid beverage base concentrates, for sale to trade or nonbottler distributors	8 5	X X	S D	11 949 D
3119304161	Liquid beverage base syrups, for sale to trade or nonbottler distributors mil cases, 192 oz case equiv 2002 1997	7	X	16.5 S	39 731 174 328
3119304Y	Liquid beverage bases, concentrates and syrups, for sale by soft drink bottlers, to trade or nonbottler distributors, nsk	N N	×	X	37 352 68 337
3119304YWV	Liquid beverage bases, concentrates and syrups, for sale by soft drink bottlers, to trade or nonbottler distributors, nsk	N N	X	××	37 352 68 337
3119305	Soft drink flavoring syrup sold in bulk	N N	x		954 685
31193051	Soft drink flavoring syrup sold in bulk	N N	XX	X	932 625
3119305111	Soft drink flavoring syrup sold in bulk, postmix mil gal 2002	N 47	X X X X	X X X X S	N 801 633
3119305121	Soft drink flavoring syrup sold in bulk, premix mil gal 2002	N 42	X	N 939.4	130 992
3119305Y	Soft drink flavoring syrup sold in bulk, nsk	N N	X I	N X	N 22 060
3119305YWV	Soft drink flavoring syrup sold in bulk, nsk	N N N	X X X X	X X X	22 060 N
3119308	Other flavoring agents (except chocolate syrups)	N N	x		3 790 585
31193081	Other flavoring agents (except chocolate syrups)	N N	X	X X X	N 3 778 131
3119308111	Flavoring syrups for fountain, ice cream, and home beverage use; excluding liquid beverage bases, soft drinks	N	X	Х	N
3119308121	in bulk, and chocolate syrups	29 N	X	D N	D N
3119308141	agent use	17 N	X X	14.9 N	D N 133 289
3119308Y	Other flavoring agents (except chocolate syrups), nsk	16 N N	X X X	S N X	133 289 N 12 454
3119308YWV	Other flavoring agents (except chocolate syrups), nsk	N N	XX	X X X	N 12 454
311930W	Flavoring syrup and concentrate manufacturing, nsk, total	N N	X		304 257
311930WY	Flavoring syrup and concentrate manufacturing, nsk, total	N N	X	X X X	348 072 304 257
311930WYWW	Flavoring syrup and concentrate manufacturing, nsk, for nonadministrative-record establishments	N N	X	×	348 072 186 127
311930WYWY	Flavoring syrup and concentrate manufacturing, nsk, for administrative-record establishments	N N	X X	X X	288 400 118 130
	1997	Ň	X	X	118 130 59 672

Note 1: For some establishments, data have been estimated from central unit values that are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: p-10 to 19 percent estimated; q-20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by S.

Note 2: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

Table 6b. Product Class Shipments for Selected States: 2002 and 1997

[Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in Table 2. Also, product classes are not shown if they are miscellaneous or "not specified by kind" classes. Statistics for some states are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 2002. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, explanation of terms, and geographic definitions, see note at end of table. For information on geographic areas followed by *, see Appendix D. For meaning of abbreviations and symbols, see introductory text]

NAICS product class code	Product class and geographic area	Value of product shipments (\$1,000)
3119301	Liquid beverage bases not for use by soft drink bottlers	
	United States	561 848
	1997 California	243 083 87 797 19 506
	New York	8 453 6 341
3119304	Liquid beverage bases, concentrates and syrups, for sale by soft drink bottlers, to trade or nonbottler distributors	
	United States	3 954 541 3 570 847
	California	111 777 123 774
	Florida	48 703 N
3119305	Soft drink flavoring syrup sold in bulk	
	United States	954 685
	California	68 942 N
	Florida	74 444
	New York	30 129 N
3119308	Other flavoring agents (except chocolate syrups)	
	United States	3 790 585
	California	690 151
	1997 New York	25 311
	Wisconsin	25 429 N

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C. For geographical definitions, see Appendix D.

Table 7. Materials Consumed by Kind: 2002 and 1997

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Material code	Material consumed	Quantity	Delivered cost (\$1,000)
311930	Flavoring syrup and concentrate manufacturing		
00900001	Total materials	X	1 226 272
31142103	1997 Fruit juices, concentrated	X P9.3	1 466 044 64 479
31131001	Sugar, cane and beet (sugar solids)	3.2 P24.4 N	33 423 15 071 N
31100003	Other natural sweeteners (including dextrose, honey, molasses, and blends of corn sweeteners and sugar) (solids)	73.0 951.5	20 355 14 648
32510057	Artificial sweeteners (solids) mil lb. 2002.	D	D
001900A1	Packaging paper and plastics film, coated and laminated	2 410.4 X X	151 981 1 616 N
32221001	Paperboard containers, boxes, and corrugated paperboard	X	63 875
00190050	Plastics wrappings, trays, carriers, etc. (including preforms)	X	38 370 D
33243101	Metal cans, lids, and ends	X X X	1 513 D 3 668
32721301	Glass containers	X	6 225
00970099	All other materials and components, parts, containers, and supplies	X	801 838
00971000	Materials, ingredients, containers, and supplies, nsk	X X X	1 066 902 143 621 155 539

Note 1: For some establishments, data have been estimated from central unit values that are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: p-10 to 19 percent estimated; q-20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by S.

Note 2: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.